

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant of:

Anraku

Serial No.: 10/561,862

Group Art Unit: 1796

Filed: December 20, 2005

Examiner: Eashoo, Mark

Title: POLYOL COMPOSITION FOR HARD POLYURETHANE FOAM AND  
METHOD FOR PRODUCING HARD POLYURETHANE FOAMDECLARATION UNDER RULE 132

Honorable Commissioner of

Patent and Trademarks

Washington, D.C. 20231

Sir:

I, Natsuko ANRAKU, a citizen of Japan and residing at  
c/o: Toyo Tire & Rubber Co., Ltd., 17-18, Edobori 1-chome, Nishi-ku, Osaka-shi, Osaka  
550-8661, Japan declare and Say as follows:

1. I was graduated from the course in chemistry, Graduate School of Science  
and Engineering, Osaka institute of technology University in 1992.

2. Since 1994 to the present time, I have been employed by Toyo Tire &  
Rubber Co., Ltd and participate in the research and development of the development of  
polyurethane foam.

3. I am the inventor of the above-identified application and am familiar with  
the subject matter thereof.

4. I have read the Official Action mailed and the references cited therein and a  
familiar with the subject matter thereof.

## 5. Object of Experiments:

To confirm the dimensional stability, in which HFC-245fa/HFC-365mfc (weight  
ratio) is 50/50 or 0/100.

## 6. Contents of Experiments:

The polyol composition having the same composition, except that the  
formulation of a blowing agent composition used was changed, was used. Components  
other than a blowing agent composition, and contents thereof are as follows.

Table 1

Component	Trade name	Supplier	Contents	Parts by weight
Polyol	A	Hitachi Kasei Polymer Co., Ltd.	Phthalic acid-based polyesterpolyol (OH value: 250)	50.0
	B	Asahi Glass Co., Ltd.	Ethylenediamine-based polyetherpolyol (OH value: 760)	35.0
	C	Dai-ichi Kogyo Seiyaku Co., Ltd.	Mannich-based polyetherpolyol (OH value: 470)	15.0
Foam stabilizer	SH-193	Dow Corning Toray Silicone Co., Ltd.	Silicone-based surfactant	2.0
Flame retardant	TMCPP	Daihachi Chemical Industry Co., Ltd.	Trismonochloropropyl phosphate	15.0
Catalyst	PELRON 9540	TOMOE engineering Co., Ltd.	Potassium octylate	4.0
	Dabco-33LV	Air Products Japan, Inc.	Triethylenediamine 33% DPG solution	4.0
Isocyanate	44V-20	Sumitomo Byer Urethane Co., Ltd.	Crude diphenylethane diisocyanate (NCO%: 31%)	189.6

The formulation (% by weight of each component based on 100% by weight of a blowing agent composition) and the amount (parts by weight based on 100 parts by weight of the entire polyol compound) of the blowing agent composition based on 100 parts by weight of a polyol compound of the above composition is shown in Table 2. The amount of the blowing agent composition to be added was adjusted so as to control the density of the hard polyurethane foam to 25 kg/m<sup>3</sup> upon free foaming.

Table 2

	Experiment 1	Experiment 2
HFC-245fa	50	0
HFC-365mfe	50	100
$\gamma$ -butyrolactone	0	0
Amount of blowing agent composition to be added	55pbw	57pbw
Dimensional stability (%)	-16	-23

The hard polyurethane foam was produced by a conventional method. That is, components other than an isocyanate component in the formulation in Table 1 and a blowing agent composition were mixed under stirring to prepare a polyol composition. After controlling the temperature to 20°C, the polyol composition and a polyol component controlling to the temperature of 20°C were mixed at an equivalent ratio NCO/OH of 1.70 under stirring, followed by foaming and curing to obtain a hard polyurethane foam.

As the blowing agent composition, compositions prepared by previously mixing according to the formulations shown in Table 2 was used.

<Evaluation>  
(Dimensional stability)

A cube measuring 100 mm × 100 mm × 100 mm was cut out from a foam formed by free foaming in a vessel, and then a dimensional change was measured after standing in an atmosphere at -30°C for 24 hours.

7. I declare further that all statements made herein of my own knowledge are true, and that all statements on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the above-identified application or any patent issuing thereon.

this 18 day of September, 2009

*Natuko Amraku*